



Division of Agricultural Resources

The Idaho

Chemigator

Chemigation Approved Backflow Prevention Assemblies for Domestic and Municipal Water Supplies

Revised March 2005

Idaho's Chemigation Program started with the passage of the Chemigation Law in 1989. The Chemigation Program is authorized by the Idaho Pesticides and Chemigation Law (Chapter 34, Title 22, *Idaho Code*) and the Idaho Rules Governing Pesticide and Chemigation Use and Application, IDAPA 02.03.03.

Chemigation is the injection of chemicals (fertilizers or pesticides) into an irrigation system. The chemigation program is designed to license, educate and regulate the injection of pesticides and fertilizers into agricultural, domestic or municipal irrigation systems. The Chemigation Program ensures that proper equipment is installed in irrigation systems to prevent the

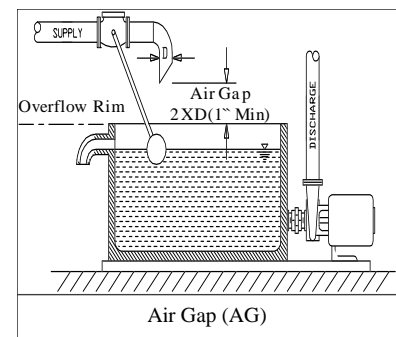
backflow of chemicals into the water source. Backflow may occur due to either "backsiphonage" or "backpressure".

Licensing: A private or professional applicator may obtain the chemigation category on their license by passing the chemigation exam. The Chemigation Study Manual, available for purchase from the ISDA office in Boise, is the recommended study material.

Equipment: Irrigation systems, such as those used in greenhouses, supplied by domestic or municipal water require either an Air Gap (AG) or a Reduced Pressure Backflow Assembly (RP). An interlock is also required.

Air Gap (AG)

An approved Air Gap (AG) is a physical separation between the free flowing inlet end of a potable water supply pipeline, and the overflow rim of a storage tank. This separation distance must be at least 2 times the inlet pipe diameter to the tank, with a minimum of at least 1 inch.



Reduced Pressure Backflow Assembly (RP)

A Reduced Pressure Backflow Assembly (RP) is designed to prevent backflow. The RP consists of two independent spring loaded check valves separated by a spring loaded differential pressure relief valve, two shutoff valves and four test cocks. Idaho's list of approved RP's is included in this brochure.



Reduced Pressure Backflow Assembly (RP)

Approved Reduced Pressure Backflow Assemblies (RP's)

Manufacturer (address) Model (size in inches)
Ames Ames Company 1485 Tanforan Ave. Woodland, CA 95695 (530) 666-2493 www.ames-co.com/ 4000B (1/2, 3/4, 1, 1-1/4, 1-1/2, 2) 4000BM2 (1) 4000BM3 (3/4) 4000CIV (2-1/2, 3, 4, 6, 8, 10) 4000SS (2-1/2, 3, 4, 6) 4000-RP (4, 6, 8, 10) (formerly model RP)
Beeco (see Hersey/Grinnell)
Buckner Buckner, Inc. 4381 N. Brawley Ave. Fresno, CA 93722 (209) 275-0500 ψ 24000 (3/4) ψ 24001 (1) ψ 24002 (1-1/4) ψ 24003 (1-1/2) ψ 24004 (2) ψ 24000/25 (3/4) ψ 24001/25 (1) ψ 24002/25 (1-1/4) ψ 24003/25 (1-1/2) ψ 24004/25 (2)
Cla-Val Cla-Val Company P.O. Box 1325 Newport Beach, CA 92659-0325 (949) 722-4800 www.cla-val.com/ RP-2 (3/4, 1, 1-1/4, 1-1/2) RP-4 (2, 2-1/2, 3, 4, 6, 8, 10) RP4V (4) RP6LW (3/4, 1, 1-1/4, 1-1/2, 2) RP6VW (3/4, 1, 1-1/2, 2) RP7LW (2-1/2, 3, 4, 6, 8, 10) RP7LY (2-1/2, 3, 4, 6, 8, 10) RP8LW (2-1/2, 3, 4, 6, 8) RP8LY (2-1/2, 3, 4, 6, 8) ψ RP8NW (2-1/2, 3, 4, 6, 8, 10) ψ RP8NY (2-1/2, 3, 4, 6, 8, 10) RP8VY (2-1/2, 3, 4, 6, 8, 10) RP8VY (2-1/2, 3, 4, 6, 8, 10)
Conbraco Conbraco Industries P.O. Box 247 Mathews, NC 28105 (704) 847-9191 www.conbraco.com/ 40-200-02 (3) 40-200-03 (3) 40-200-05 (3) 40-201-02 (1/4) 40-201-A2 (1/4) 40-201-A2S (1/4) 40-201T2 (1/4) (formerly 40-201-99T (1/4)) 40-202-02 (3/8) 40-202-A2 (3/8) 40-202-A2S (3/8) 40-202-T2 (3/8) (40-202-99T (3/8))

Manufacturer (Address) Model (Size in inches)
Conbraco (continued) 40-203-02 (1/2) 40-203-A2 (1/2) 40-203-A2S (1/2) 40-203-T2 (1/2) (formerly 40-203-99T (1/2)) 40-204-02 (3/4) 40-204-T2 (3/4) (formerly 40-204-99T (3/4)) 40-204-A2 (3/4) 40-204-A2S (3/4) 40-204-A2U (3/4) 40-204-A2Z (3/4) 40-204-TC2 (3/4) 40-204-TCU (3/4) 40-205-02 (1) 40-205-T2 (1) (formerly 40-205-99T (1)) 40-205-A2 (1) 40-205-A2S (1) 40-205-A2U (1) 40-205-A2Z (1) 40-205-TC2 (1) 40-205-TCU (1) 40-206-02 (1-1/4) 40-206-A2 (1-1/4) 40-206-A2U (1-1/4) 40-206-A2Z (1-1/4) 40-206-T2 (1-1/4) (formerly 40-206-99T (1-1/4)) 40-207-02 (1-1/2) 40-207-A2 (1-1/2) 40-207-A2U (1-1/2) 40-207-A2Z (1-1/2) 40-207-T2 (1-1/2) (formerly 40-207-99T (1-1/2)) 40-208-02 (2) 40-208-A2 (2) 40-208-A4 (2) 40-208-A2U (2) 40-208-A2Z (2) 40-208-T2 (2) (formerly 40-208-99T (2)) 40-209-02 (2-1/2) 40-209-03 (2-1/2) 40-209-05 (2-1/2) 40-20A-02 (4) 40-20A-03 (4) 40-20A-05 (4) 40-20C-02 (6) 40-20C-03 (6) 40-20C-05 (6) 40-20E-02 (8) 40-20E-03 (8) 40-20G-02 (10) 40-20G-03 (10)
Febco Febco Division of CMB Industries P.O. Box 8070 Fresno, CA 93747 (559) 252-0791 www.cmb-ind/febco/ ψ 825 (2-1/2, 3, 4, 6, 8, 10) ψ 835B (3/4, 1, 1-1/2, 2) ψ 825D (2-1/2, 3, 4, 6, 8, 10) (formerly 825 type D) 825Y (3/4, 1, 1-1/4, 1-1/2, 2) 825YA (3/4, 1, 1-1/2, 2) 825YAR (3/4, 1, 1-1/2, 2) 825YD (2-1/2, 3, 4, 6, 8, 10) 825YR (3/4, 1, 1-1/2, 2) 860 (1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4, 6, 8) 860U (1/2, 3/4, 1, 1-1/4, 1-1/2, 2) 880 (2-1/2, 3, 4, 6, 8, 10) 880V (2-1/2, 3, 4, 6, 8, 10)

Manufacturer (Address) Model (Size in inches)
Flomatic Flomatic 145 Murray Street Glens Falls, NY 12801-4424 (800) 833-2040 www.flowmatic.com/ RPZ (3/4, 1, 1-1/2, 2, 2-1/2, 3, 4, 6) RPZE (3/4, 1, 1-1/2, 2) RPZII (1/2, 3/4) RPZIIIE (1/2, 3/4)
Hersey/Grinnell Grinnell Corporation Research & Development Center 1467 Elmwood Ave. Cranston, RI 02910 (401) 781-8220 www.grinnell.com/ 6CM (2-1/2, 3, 4, 6, 8, 10) FRP-II (3/4, 1, 1-1/4, 1-1/2, 2) 6CM-Bronze (2-1/2, 3, 4, 6)
Neptune (see Wilkins)
Richwell (see Wilkins)
Watts Watts Regulator Company 815 Chestnut Street North Andover, MA 01845 (978) 688-1811 www.wattsreg.com/ 009 (2-1/2, 3) ψ 009 (4, 6) ψ 009M1QT (1-1/4, 1-1/2, 2) ψ 009M1PQT (1-1/4, 1-1/2, 2) 009M2QT (3/4, 1, 1-1/4, 1-1/2, 2) 009M2PCQT (1, 1-1/4, 1-1/2, 2) 009M3QT (3/4) 009PCQT (1/2, 3/4) ψ 009PCQT (1, 1-1/4, 1-1/2, 2) 009QT (1/4, 3/8, 1/2, 3/4) ψ 009QT (1, 1-1/4, 1-1/2, 2) ψ 009SSM1QT (2) ψ 009SSM1PCQT (2) ψ 009SSPCQT (3/4, 1, 1-1/4, 1-1/2, 2) ψ 009SSQT (3/4, 1, 1-1/4, 1-1/2, 2) 909 (2-1/2, 3, 4, 6) ψ 909 (8, 10) 909BB (2-1/2, 3) 909HWQT (3/4, 1) 909HWM1QT (1-1/4, 1-1/2, 2) 909M1 (8, 10) 909M1QT (1-1/4, 1-1/2, 2) 909M1QTFDA (8, 10) 909PCHWM1QT (1-1/4, 1-1/2, 2) 909PCHWQT (3/4, 1) 909PCM1QT (1-1/4, 1-1/2, 2) 909PCQT (3/4, 1) 909PCQT (3/4, 1) (vertical up) 909QT (3/4, 1) 909QT (3/4, 1) (vertical up) 909QTFDA (2-1/2, 3, 4, 6)

Approved Reduced Pressure Backflow Assemblies (RP's)

Manufacturer (Address) Model (Size in inches)	Manufacturer (Address) Model (Size in inches)	Manufacturer (Address) Model (Size in inches)
Watts (continued) ψ 990 (4, 8) ψ 990QT-FDA (4, 8) ψ 992 (4, 10) 994 (2-1/2, 3, 4, 6) 995QT (1/2, 3/4, 1, 1-1/4, 1-1/2) FAE909QT (1-1/4, 1-1/2, 2) FAE909HWQT (1-1/4, 1-1/2, 2) SS009M3QT (1/4, 3/8, 1/2, 3/4) SS009QT (1) U009APCQT (3/4) ψ U009APCQT (1) U009AQT (3/4) ψ U009AQT (1) ψ U009M1APCQT (1-1/2, 2) ψ U009M1AQT (1-1/2, 2) U009M1PCQT (1-1/4, 1-1/2, 2) U009M1QT (1-1/4) ψ U009M1QT (1-1/2, 2) U009M2APCQT (1, 1-1/2, 2) U009M2AQT (1, 1-1/2, 2) U009M2PCQT (1, 1-1/2, 2) U009M2QT (3/4, 1, 1-1/2, 2) U009PCQT (1/2, 3/4)	Watts (continued) ψ U009PCQT (1, 1-1/4, 1-1/2, 2) U009QT (1/2) ψ U009QT (3/4, 1, 1-1/4, 1-1/2, 2) ψ U009SSPCQT (3/4, 1, 1-1/4, 1-1/2, 2) ψ U009SSQT (3/4, 1, 1-1/4, 1-1/2, 2) U909QT (3/4, 1) U909QT (3/4, 1) (vertical up) U909HWQT (3/4, 1) Wilkins Wilkins Regulator Company 1747 Commerce Way Paso Robles, CA 93446 (800) 817-8177 www.zurn.com/wilkins/wilkins.htm/ 375 (2-1/2, 3, 4, 6) 375G (2-1/2, 3, 4, 6) 375GPI (4, 6) 375PI (4, 6) 475 (2-1/2, 3) 475 (4, 6) (vertical-up inlet vertical down outlet)	Wilkins (continued) 475G (2-1/2, 3) 475G (4, 6) (vertical-up inlet vertical down outlet) 475V (2-1/2, 3) 475V (4, 6) (vertical-up inlet vertical-up outlet) 475VG (2-1/2, 3) 475VG (4, 6) (vertical-up inlet vertical-up outlet) ψ 575 (3/4, 2-1/2, 3, 4, 6) ψ 575 (1-1/4, 1-1/2, 2) (MOD-III) ψ 575A (3/4, 1) ψ 575M8 (4 X 4 X 8 Manifold, formerly MBC 8") ψ 575-M10 (6 X 6 X 10 Manifold, formerly MBC 10") 975 (3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 4, 6, 8, 10) 975A (3/4, 1, 1-1/4, 1-1/2, 2) 975BMS (2-1/2, 3, 4, 6, 8, 10) 975G (4, 6) 975MS (2-1/2, 3, 4, 6, 8, 10) 975XL (1/4, 3/8, 1/2, 3/4, 1, 1-1/4, 1-1/2, 2) 975XLBMS (3/4, 1, 1-1/4, 1-1/2, 2) 975XLMS (3/4, 1, 1-1/4, 1-1/2, 2) 975XLSE (3/4, 1, 1-1/4, 1-1/2, 2) 975XLSEU (3/4, 1, 1-1/4, 1-1/2, 2) 975XLU (3/4, 1, 1-1/2, 2) 975XLV (3/4, 1)

ψ - Only Spare Parts Available

Trouble Shooting Guide for Reduced Pressure Backflow Assemblies (RP's)

Problem	Cause	Solution
1.0 Valve spits periodically from the vent.	1.1 Fluctuating supply pressure. 1.2 Fluctuating downstream pressure.	1.1 Install a soft seated check valve immediately upstream of the device. 1.2 Install a soft seated check valve downstream of the device close as possible to the shutoff valve.
2.0 Valve drips continually from the vent.	2.1 Fouled first check. 2.2 Damaged or fouled relief valve seat. 2.3 Relief valve piston "O" ring not free to move due to pipe scale, dirt or build-up of mineral deposits. 2.4 Excessive backpressure, freezing or water hammer has distorted the second check. 2.5 Electrolysis of relief valve seat or first check seats. 2.6 Valve improperly reassembled.	2.1 Flush valve. If flushing does not resolve problem, disassemble valve and clean or replace the first check. 2.2 Clean or replace the relief valve seat. 2.3 Clean, grease or replace the piston "O" ring. 2.4 Eliminate source of excessive backpressure or water hammer in the system downstream of the device. Use a device specified by the manufacturer to dampen out backpressure and to eliminate water hammer. Replace defective second check assembly. In case of freezing; thaw, disassemble and inspect internal components. Replace as necessary. 2.5 Replace relief valve seat or inlet cover. Install dielectric unions. Electrically ground the piping system and/or electrically isolate the device with plastic pipe immediately upstream and downstream of the device. 2.6 If valve is disassembled during installation, caution must be exercised to install check springs in their proper location.
3.0 Valve exhibits high pressure drop.	3.1 Fouled strainer. 3.2 Valve too small for flows encountered.	3.1 Clean strainer element or replace. 3.2 Install proper size device based upon flow requirements.
4.0 No water flows downstream of valve.	4.1 Valve installed backwards.	4.1 Install valve in accordance with flow direction arrow.
5.0 Valve does not test properly.	5.1 Follow manufacturer's test procedure. 5.2 Leaky downstream gate valve.	5.1, 5.2 Clean or replace gate valve with full port ball valves or resilient wedge shutoff valves.
6.0 Valve quickly and repeatedly fouls following servicing.	6.1 Debris in pipe line is too fine to be trapped by strainer.	6.1 Install finer mesh strainer element in the strainer.
7.0 Winterization of backflow preventers.		7.1 Electric heat-tape wrap closely together around valve body. Build a small shelter around the valve with a large light bulb installed and left on at all times. If supply line is not used during the winter, removal of the complete body is the best. This would create an air gap to eliminate any possible backflow.

Chemical Injection Devices

The chemical injection device draws chemical from the chemical tank and pumps it into the irrigation system. The components of the injection device must be resistant to the chemicals you plan to use. Consult the owner's manual or the manufacturer of the device to assure compatibility of the device with chemicals used.

If the chemical injection device is a metering pump it must be capable of being fitted with a system interlock that shuts down the pump in the event of loss of system pressure. A venturi-type injection device must be capable of being fitted with a functional, automatic quick closing check valve to prevent the flow of liquid back toward the chemical supply tank and either a functional hydraulically operated valve which opens only when the main water line is adequately pressurized. In bypass systems as an option to placing both valves in the line from the chemical supply tank, the check valve may be installed in the bypass immediately upstream of the venturi water inlet and either the normally closed solenoid or hydraulically operated valve may be installed immediately downstream of the venturi water outlet.

Please consult ISDA Rules Governing Pesticide and Chemigation Use and Application before installing and using chemigation systems.

Approved Chemical Injection Devices

Manufacturer	Model
Dosmatic U.S.A.	Advantage Series (A10, A12, A20, A30, A40, A80, DP30, T100), Doselec
Dosatron	D Series (All)
Smith Precision Products	R-1, R-3, R-4, R-6, R-8
H. E. Anderson Co.	Andy Series (DD100, DD200, DD400, DD1000, DD1200), Andy Jr. Series (DB100, D200, DB400, DB1000, DB1200, DB100PB, DB100P, DB1000PB, DB1000P), J Plus Series (JD31, JD32, JD52, JD104, JD104-2, JD103, JD103-3, JD164, JD164-2, JD164-4), S Series (SDN2-BA, SDN2-BAR)
Chemilizer Products, Inc.	HN55 Series, CP33 Series

Chemical injection devices used for injection of chemicals into irrigation systems that operate from municipal or domestic water supplies.





Idaho State Department of Agriculture
Idaho's Chemigation Program
629 C Washington St. N
Twin Falls, ID 83301

Place
First
Class
Stamp
Here

ADDRESS CORRECTION REQUESTED

For further information, contact:

ISDA Inspectors

Coeur d'Alene

Chuck Hawley (208) 762-9586
Tim Stein (208) 762-9598

Idaho Falls

Steve Hobley (208) 525-7158

Nampa

David Chase (208) 465-8482
Luis Urias (208) 465-8478
Bob Hays (208) 442-2803
Vic Mason (208) 465-8442

Pocatello

Steve Riedy (208) 236-6091
Kenneth Funk (208) 236-6352

Twin Falls

Randy Quigley (208) 736-5277
Jim Childs (208) 736-4790
Rod Gabehart (208) 736-4759

Idaho's Chemigation Program

Jim Childs, Program Specialist
Idaho State Department of Agriculture
629 C. Washington St. N.
Twin Falls, ID 83301

Phone: (208) 736-4790
Fax: (208) 736-4780
Email: jchilds@idahoag.us

Idaho's Chemigation Web Site:

www.agri.state.id.us/agresource.chemigation.htm

Idaho State Department of Agriculture Web Site:

www.agri.state.id.us

Even though a specific model has met required specifications during initial product review, each valve must meet the specifications when inspected on site. If an individual valve does not meet the specifications when inspected, it must be repaired or replaced prior to using the chemigation process.

The listed chemigation equipment has met the test criteria as specified in the Pesticides and Chemigation Law, Section 22-3407B, Idaho Code and the Rules Governing Pesticide and Chemigation Use and Application, IDAPA 02.03.03.966 and is approved for use in Idaho.

Costs associated with this publication are from Idaho State Department of Agriculture in accordance with Section 60-202, Idaho Code. 12/02/32302